

The Aesthetics of AI-Generated Paintings: What Changes Compared to Previous Art Forms?

Abstract

Artificial Intelligence Generated Artworks (AIG-Artworks) have recently entered the art market and have been profitably sold at auction houses such as Christie's. Although this phenomenon is still at an embryonic stage, a foundational analysis on the aesthetic value of such artworks will soon become necessary. This paper performs this aesthetic judgement on the beauty of AI Generative Art (AIG-Art), adopting a tripartite view of aesthetic judgements: as comprised of judgements on *free*, *dependent* and *intellectual* beauty. Each of these aspects is evaluated: the free beauty of these artworks is deemed equitable in terms of parameters to any human generated art. Both dependent and intellectual beauty are, however, considered impossible to judge according to the same meters of human art as these algorithms do not create an explicit semantic representation of their art. For this reason, the paper suggests allowing for judgements *a posteriori* of the interaction between the artwork and the audience: judgements on the *imagined experience* of the viewer. To conduct this analysis, the essay first examines the literature on the current generative frameworks and on the aesthetics of beauty. The first successful generative framework appeared only in 2014 with Goodfellow et al. and many have been the adaptations and improvements to the latter. Ever since, academics have extensively analyzed the aesthetic potential of AI machines as artists, but have overlooked the potential of the artwork itself. The findings of this research imply that the former approach centered on the artist is imprudent and that attention should be shifted to the audience and to the artwork itself.

Keywords: AI Generated Art, Aesthetics, Imagined Experience,
Computer Vision, Beauty



Picture 1: *Edmond de Belamy*, a portrait generated by artificial intelligence, on display at Christie's. TIMOTHY CLARY/AFP/GETTY IMAGES

Introduction

When looking at the painting above, one might wonder whether it is an incomplete Degas or an unknown Impressionist that has only now appeared on the market. The reality is: an Artificial Intelligence (AI) called GAN imagined and painted it in a way that is indistinguishable from human generated paintings.

Although the possibility of generating art through AI had long been discussed in the past century, the first successful generative framework appeared only in 2014 with Goodfellow et al. The authors designed a GAN (Generative Adversarial Network) consisting of two nets competing against each other, the *generator* and the *discriminator* (Goodfellow et al., 2014). In 2017, a new framework was built on top of GAN to introduce the factor of creativity to the generation: Creative Adversarial Network (CAN) (Elgammal et al., 2017). Academics have extensively analyzed the aesthetic potential of AI machines as artists (Hertzmann, 2018; Mazzone & Elgammal, 2019): Hertzmann (2018) claims that GANs and CANs lack human expressiveness, inspiration and intent, and thus only serve as tools to artists. Mazzone & Elgammal (2019) agree with Hertzmann in seeing GAN merely as a tool, but value CAN as a *medium*, as it is aware of painting styles, constrictions of the canvas and more.

Despite the vast research on the machine as artist, no aesthetic analysis has been conducted on the value of the generated artwork itself. For this reason, this paper proposes an aesthetic judgement on the beauty of AI Generative Art (AIG-Art), concluding that it is intrinsically different from those on other artworks due to the lack of expressiveness and intention of the AI painter.

Although AIG-Art is still at its embryonic stage, in a probable future in which museums and galleries will have to deal with such art forms daily, a foundational analysis on the aesthetic value of GAN's and CAN's will become necessary. In the analysis, this paper adopts both secondary sources on the aesthetic potentiality of AI artists (Hertzmann, 2018;

Mazzone, 2019) and on foundational papers on the philosophy of aesthetics (Zangwill, 2003; Kant, 1987).

The AI Generative Art Framework

AIG-Art is a recently established subfield of Generative Art that adopts productive methods from Artificial Intelligence. As such, it follows the characteristics of Generative Art: it is a ‘work that has been produced by the activation of a set of rules and where the artist lets a computer system take over at least some of the decision-making’ (Boden & Edmonds, 2009, p.23). In the specific case of AIG-Art, the set of rules and decision-making are provided by Artificial Neural Networks (ANNs) on the basis of the given input artworks. As Galanter (2016) stresses, the main element of Generative Art is the adoption of a *system*, that plays a role in the production and is, at the same time, external to the artist.

To further understand the nature of AIG-Art it is therefore important to discuss the nature of this *system*. Currently, the state-of-the-art generative frameworks are based on Adversarial Networks (a subgroup of ANNs) where the *generator* learns how to produce an artwork and the *discriminator* provides feedback about the probability of this produced artwork to pass for human generated (Goodfellow et al., 2014). The framework outputs artworks that emulate a traditional, pre-established, style depending on the style of the inputs. In so doing, these networks (GAN) do not produce any explicit representation of art and styles and are limited to the creation of artworks that belong to such a pre-established style (Goodfellow et al., 2014; Elgammal et al., 2017).

The creative framework proposed by Elgammal et al. (2017), CAN, resolves this second limitation by introducing a creative factor that encodes Martindale’s definition of art creation as the ‘*arousal potential*’ provoked by new art in the spectator. In terms of algorithm, the ‘arousal potential’ is obtained by maximizing the stylistic ambiguity and constructing a clear representation of existing style classes (Elgammal et al., 2017). Although also CANs lack a semantic understanding of art, differently from GAN, they extrapolate concepts of style and deviate from pre-established ones.

In both algorithms, the task of the human artist is confined to pre and post curatorial adjustments (Mazzone, 2019). This entails that the process of generation is almost completely in the hands of the machine and, as such, that the aesthetic judgement on this art is predominantly a judgement of the machine’s creation.

An Aesthetic Judgement on the beauty of AI Generative Art

A Definition of Aesthetic Judgement

Of the different aesthetic judgements, this paper focuses on the *judgement of beauty*, which is seen by Zangwill (2003) as preeminent over all other aesthetic judgements. A judgement on beauty is innately dichotomic and contradictory as is beauty itself (Zangwill, 2003). An aesthetic judgement on beauty is, as defined by Kant (1987), *subjectively*

universal: it is postulated by the individual and has a ‘claim to correctness’ (Zangwill, 2003, p. 3). As such, when confronted with an artwork, humans develop a cognitive response that goes beyond the scope of mere perception. This metaphysical response is caused by the *intellectual* component of beauty, as for instance are representational and societal cognitions (McMahon, 1999). Furthermore, Kant also defines beauty both in itself ‘without necessity of any external prior concepts’ and as ‘the concept of the object and its purpose’ (Kant, 1987, p. 36). This distinction is important as it is formulated into the dichotomic concepts respectively of *free beauty* (the set of external features of the object) and *dependent beauty* (the beauty with respect to how well the object serves its purpose or intention; Zangwill, 2003).

Following these definitions, this paper conducts the aesthetic judgement on AIG-Art distinguishing between its *free*, *dependent* and *intellectual* beauty.

The free beauty of AI Generative Art

The *free beauty* of these artworks is, in most cases, completely equatable to that of any human generated paintings. Arora et al. (2018) proved that the current state-of-the-art generative algorithms are still unable to fully learn the distribution of art and the image outputted is therefore the creation of this failed distribution. However, humans, when asked to determine whether an artwork is made by an AI or by a person, are unable to trace such distinction with confidence (Mazzone, 2019). According to a study conducted by Elgammal et al. (2017), CAN models out-performed GANs because human subjects deem the previous as human 53% of the time, as opposed to the 35% for GANs. More interestingly, human subjects rated the images generated by CAN higher on a scale from machine to human than the ones from the Art Basel set (53% vs. 41%) that are human created. Even Hertzmann (2018), from his skeptical view on AIG-Art, recognizes the familiarity of the style of CAN generated art.

Albeit admitting that these algorithms need to undergo further developments, these studies and considerations show that they certainly have the potentiality to equate the free beauty of human art, especially with respect to their harmony and attention to detail (Smith and Leymarie, 2017).

The dependent beauty of AI Generative Art

On the other hand, a judgement on *dependent beauty* of AI Generative artworks appears to be impossible. When looking at the painting, one is left speculating on the reason why the AI produced this work and if it is a result of intention. This inexplicability is identified by Galanter (2016) as the ‘*problem of intent*’: given that the art produced by these algorithms is randomized, the AI painter cannot show a single predetermined intent. Gorichanaz (2018) argues that the difference in the aesthetic judgement appears when dealing with the art-making process as *experience*, since the latter is not currently observable in machines. The author conducts a case study using phenomenology of practice to examine what humans experience in the process of art making (Gorichanaz, 2018). His results identify

‘intention’ as the crucial process of continuous questioning that the artists carried out on the τι ἔστι (literally translatable as ‘what is’) of their work (Gorichanaz, 2018). Also Hertzmann (2018) and Mazzone & Elgammal (2019) appear rather intransigent on the requirement of human intent and inspiration, pinpointing that the intent of the machine is necessarily strictly limited to fulfilling its task.

It appears, therefore, that however we define ‘intention’, an AI will inevitably be unable to account for it. For this reason, this paper suggests to take a rather postmodern approach and limit the dependent beauty to the side of the audience. That is, to take into consideration the *‘imagined experience’* that the viewer reconstructs when faced with the artwork. The paper will now proceed to analyse intellectual beauty and, consequently, expand upon this previous claim in the final paragraph.

The intellectual beauty of AI Generative Art

This last aspect of aesthetics is excluded in the canon drafted by Zangwill (2003) and is therefore the most controversial. McMahon (1999) traces in the cognitive response, here used as a synonym of *intellectual* beauty, the root of dynamism in aesthetic judgements, which he opposes to the static essence of human perceptions on beauty (McMahon, 1999). Further, its importance is witnessed in the Romantic trend to describe beauty as an illusory epiphany which eventually turns out to reside in the self, as epitomized by the ‘Hymn to Intellectual Beauty’ by Shelley (1816). In the poem, the author rejoices of the apparition of the spirit of intellectual beauty and delineates it using the metaphoric periphrasis of ‘summer winds that creep from flower to flower’ (Shelley, 1816, line 4), referring to the transcendent and mysterious nature of this spirit (Hall, 1983). At the end of the poem, Shelley realises that this spirit resides in himself (‘sudden, thy shadow fell on me; I shrieked, and clasped my hands in ecstasy!’, Shelley, 1816, line 60). The two authors presented above support the claim to introduce intellectual beauty among aesthetic properties: Shelley successfully brings intellectual beauty to the level of emotionality and subjectivity of the self, retaining an aura of mysticism and transcendence to it. McMahon, contradicting Zangwill’s point, accepts it in light of the necessity to account for dynamism in our concept of beauty.

Similarly to dependent beauty, intellectual beauty is currently impossible to account for in machines. These machines lack semantic understanding of their work, which entails that any oeuvre they produced has no referential value outside of the painting itself. The importance of including these referential values has been discussed by Smith and Leymarie (2017), who point out that our contemporary concept of beauty is heavily reliant on its connection to environmental and societal issues. Also Hertzmann (2018) defines art as a social act. Studies have proven that this interaction is indispensable for human art creation (Gorichanaz, 2018).

Although these researches show the essentiality of encoding intellectual beauty into machines (in terms of representational purposes, societal references and subjectivity), Broekmann (2019) cleverly brings to our attention that such artificially generated artworks still produce a transcendent reaction in the viewers. According to what has been discussed

above, this paper proposes, one more time, to move the judgements on intellectual beauty to the ‘*imagined experience*’ observed by the audience. The following paragraph will discuss why such movement is accepted and what it entails.

The imagined experience

Despite this shift from a judgement based on *interaction* between author and viewer to one based only on the viewer may appear drastic (albeit proven necessary), it is important to notice that modernity has already obliged literates to redefine the concept of the ‘*author*’. This proposal is, in fact, in accordance to the notorious definition of the ‘*author*’ by Foucault (1969): an artist is not the physical person that made the oeuvre, but a *social construct* made by the viewer to make sense of the work. This definition suggests that this limitation to only the viewer’s side is not an added limit, but rather it is the case for all artworks. Further, Audry and Ippolito (2019) finely showed the efficacy of adopting the ‘*imagined experience*’ stance by posing the following thought experiment: if we imagine a viewer looking at a painting and the viewer is told the artwork is human made, they would ascribe to the work sentiment and subjectivity, regardless of what the real author is. Similarly, Aguera y Arcas (2017) demonstrates that this move would accommodate both the philistine notion of art (for its assumption that the author is not analysable) and the practical view (that recognizes the lack of complete interpretability of these machine). In short, these are only a small portion of the numerous accounts on the concept of author, but they, nevertheless, can be considered valuable reasons for shifting the attention to *imagined experience*.

Conclusion

In conclusion, an aesthetic judgement on AI Generative Art is comprised of three aspects: its free, dependent and intellectual beauty. With regards to the free beauty, the same parameters used for human art can be used to evaluate a AIG-Art: these include harmony and complexity. This applicability is due to the fact that such artworks are produced by algorithms that learn the visual aesthetics of past artworks and reproduce them on canvas. In the case of both dependent and intellectual beauty, this is no longer true: both the GAN and CAN algorithms do not create an explicit semantic representation of their art, which makes it impossible to make a priori judgements on their ‘intention’ and ‘representation’. For this reason, the paper suggested to allow for judgements a posteriori of the interaction between the art and the audience. In this way, both a judgement on the telos and on the wider significance of the oeuvre would be based on the ‘*imagined experience*’ of the audience.

These findings entail a change in what an aesthetic judgement is: the subjective universality is maintained only in the free beauty, while dependent and intellectual beauty are now shifted towards a lesser universal definition. That is due to the fact that the burden of the judgement is moved to *only* the audience, depriving the judgement of the stability of the original intention of the artist. These results raise some fundamental questions that need to be addressed in future research:

- Can the *imagined experience* of the audience be expressed?

- Will AIG-Art be integrated in the art canon? Will it be exhibited in museums?
- Does this new movement urge us to redefine what art is?
- Does the loss in interpretability of the author make the experience of art a unilateral experience rather than an interaction?
- What is the role of the meta-artist (the coder of the algorithm)?

Although there are numerous areas that still need to be researched in the future, this paper has successfully established a quantifiable approach for evaluating the aesthetic value of all artworks. It has expanded on its preliminary claim: that an aesthetic judgement on AIG-Art ‘is intrinsically different from those on other artworks due to the lack of expressiveness and intention of the AI painter’ by pointing out the nature of this intrinsic difference: the unilaterality of the contemporary art experience, and it has proposed, conformingly, to adopt a one-sided judgement that would be limited to the imagined experience of the audience.

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